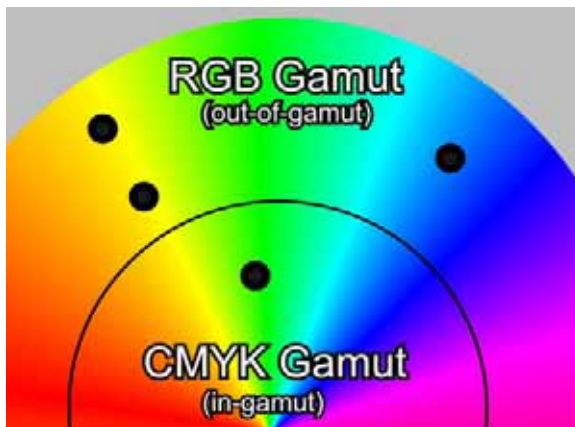


Understanding Rendering Intents Guide

Understanding everything that has to do with Color Management is a difficult task to take on. However, understanding some of the key items (i.e. color space, profiles and rendering intents) can help you when trying to print a final output (i.e. sublimation / inkjet transfers, direct-to-garment print,...). Below is a brief explanation of the four types of rendering intents and how they all act differently when converting colors from one color space (or color gamut) to another.

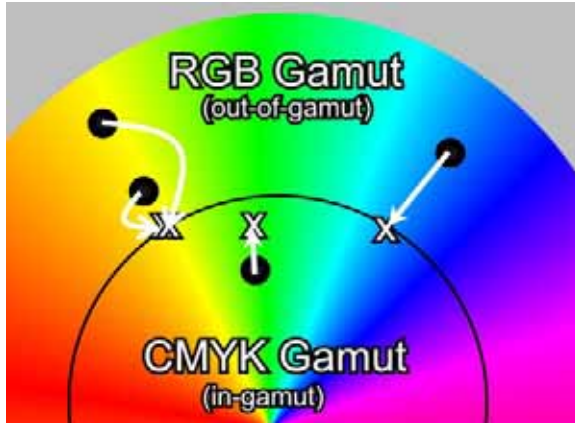
To better understand this technical information, we will use an example where we are trying to print four colors (identified by the black circles) in an RGB color space to a CMYK output device (i.e. your printer). One of our colors will fall within the CMYK gamut (also known as in-gamut) and the other three will fall in the RGB gamut (also known as out-of-gamut). Below is an illustration of this example.



Saturation

This rendering intent preserves the saturation (or better known as brightness) of colors when preparing them to be printed for final output. The Saturation intent will map or transform fully saturated source colors to fully saturated target colors. Saturation intent is the preferred rendering intent where color matching and exact relationships between colors is less important than getting bright colors. The best results from this intent are when you are printing solid colors in a vector artwork and you want them to print bold. Saturation intent is not recommended when printing photographs.

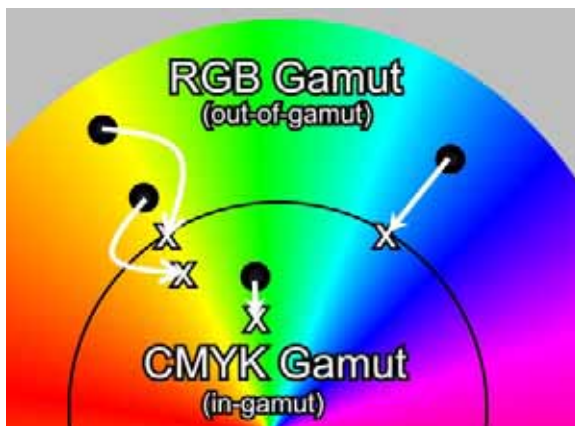
In our example, the three out-of-gamut colors are moved to the closest in-gamut color that are fully saturated and all the in-gamut colors are adjusted to the corresponding fully saturated colors. Thus, all the colors are changed and the changes are not proportional to the tonal values.



Perceptual

This rendering intent compresses out-of-gamut color proportionally in order to preserve the relationships (hue and tonal differences) between in-gamut colors. This prevents "gamut clipping" with its potential loss of detail and tonal values. Gamut clipping occurs when colors that are different in the input image appear the same when printed. The perceptual rendering intent makes tiny changes throughout the entire color space of the graphic in order to preserve relationships for all the colors in the graphic. In doing so, this rendering intent must sacrifice some accuracy of in-gamut colors in order to maintain the color relationships. Perceptual intent is widely used for photographs and prints that don't require 100% color critical, but that are detail critical. Perceptual intent usually will produce the most predictable results when printing RGB images on CMYK devices (i.e. direct-to-garment machines, dye sublimation / inkjet transfer printers,...). Perceptual intent is not recommended for proofing offset presses or for giclee printing due to the lack of accuracy.

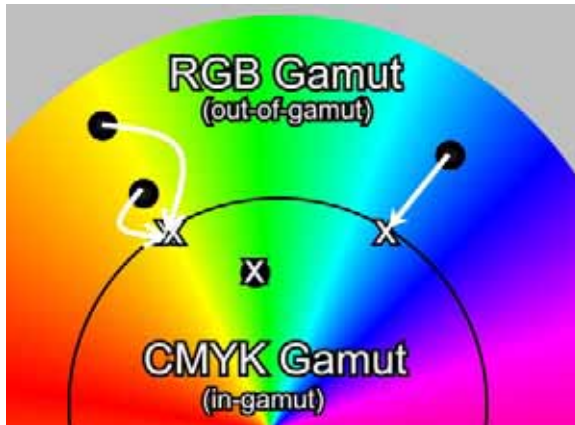
In our example, this rendering intent will shift all four colors (whether inside or outside the gamut) in order to keep the tonal / hue relationships.



Colorimetric

The Colorimetric rendering intents (Absolute and Relative) are rendering intents that will only compress the out-of-gamut colors and will leave the in-gamut colors alone. The result is that the out-of-gamut colors will be adjusted to the closest match within the gamut. Thus, some gamut clipping (i.e. the tonal / hue differences between colors will not be proportional) will occur. The only difference between Absolute and Relative Colorimetric is how each one treats the white point.

In our example, the one color that is in-gamut is left alone as much as possible. The three other colors are adjusted so that they match up to the closest color in-gamut. Thus, the final printed output will not contain the same color differences as the graphic.



Absolute Colorimetric

In Absolute Colorimetric, the white Thus, this rendering intent can add some color shades to your white area on your design (i.e. the white area of your design is printing with a touch of yellow in it). This rendering intent is recommended for when printing spot colors or wanting to create a newspaper proof with the color of the newsprint in the background, but usually makes it unusable for almost all other types of printing. Thus, Absolute Colorimetric is recommended only to be used to simulate a final output on your monitor and should not be used to create a final output.

Relative Colorimetric

Relative Colorimetric will map or adjust the white point of the design to that of the substrate that it is going to be on. Thus, the human eye will still view the white in the final output as white by shifting the colors of the rest of the graphic to offset the color of the white in the substrate.